CLAIMS

1. A process for the oxidation of hydrogen sulfide which comprises:

a) putting a gas containing H_2S in contact with an aqueous acid solution of trivalent iron and containing a hetero polyacid having redox properties, as such or partially salified with an alkaline metal or with ammonium, selected from those having general formula (I):

$$H_n X V_y M_{(12-y)} O_{40} \qquad (I)$$

wherein n is an integer ranging from 3 to 6, X is an element selected from P, Si, As, B, Ge, y is an integer ranging from 1 to 3 and M consists of Mo or W.

b) filtering and separating the sulfur produced due to the oxidizing effect of the trivalent iron which is reduced to bivalent iron;

c) re-oxidizing the bivalent iron to trivalent iron with a gaseous stream containing oxygen; and

d) recycling the solution containing trivalent iron and the hetero polyacid to the oxidation step (a).

2. The process according to claim 1, wherein the hetero polyacid is used in a solid form insoluble in water, selected from:

- partial or complete salification with metals, whose salts are insoluble, selected from cesium, ammonium, potassium, silver and thallium(I);
- laying and immobilization on silica;
- laying and immobilization on mesoporous molecular sieves, such as HMS and MCM-41;
- laying and immobilization on activated carbon.

3. A process for the oxidation of hydrogen sulfide which comprises:

a_1) putting a gas containing H_2S in contact with an aqueous acid solution containing a hetero polyacid having redox properties, as such or partially salified, with an alkaline metal or with ammonium, selected from those having general formula (II):

$$H_n\ Me\ M_{12}\ O_{40} \qquad (II)$$

wherein n is an integer ranging from 2 to 7, Me is selected from Fe, Co, Mn, Cu, Cr whereas M consists of Mo or W.

b_1) filtering and separating the sulfur produced due to the oxidizing effect of the element Me which is reduced;

c_1) re-oxidizing the element Me with a gaseous stream containing oxygen; and

d_1) recycling the re-oxidized solution to the oxidation step (a).

4. The process according to claim 1, wherein the triva-

lent iron is present as a salt of an inorganic acid.

5. The process according to claim 4, wherein the acid is selected from nitric acid, sulfuric acid, phosphoric acid.

6. The process according to claim 1, 2, 4 or 5, wherein the trivalent iron is present in the solution in concentrations ranging from 0.01 to 10 moles/l.

7. The process according to claim 1, wherein the hetero polyacid compound (I) is present in concentrations ranging from 0.01 to 0.3 moles/l.

8. The process according to claim 6 or 7, wherein the molar ratio hetero polyacid compound (I)/trivalent iron ranges from 1/1 to 1/30.

9. The process according to claim 3, wherein the hetero polyacid compound (II) is present in concentrations ranging from 0.01 to 0.3 moles/l.

10. The process according to any of the previous claims, wherein the aqueous acid solution has a pH ranging from 0 to 6.

11. The process according to any of the previous claims, wherein the hydrogen sulfide is present in the gas fed in a concentration ranging from 0.1 to 30% by volume, the remaining percentage consisting of a gas which is inert under the reaction conditions.

12. The process according to claim 11, wherein the inert gas is methane gas or natural gas.

13. The process according to any of the previous claims, wherein the re-oxidation step takes place at a temperature ranging from 20 to 100°C and at atmospheric pressure or a value slightly higher than atmospheric pressure.

14. The process according to any of the previous claims, wherein the gaseous stream containing oxygen consists of air, oxygen-enriched air, oxygen.